## REMARKS

The present application was filed on July 10, 2003 with claims 1 through 21. Claims 1-5, 7-15 and 17-21 are presently pending in the above-identified patent application. Claims 10-13 have been withdrawn from consideration in response to a restriction requirement. Applicant acknowledges that while claims 10-13 have been withdrawn from consideration, as noted above, these claims are still pending in the present application. Claims 6 and 16 have been previously canceled without prejudice. Applicant herein proposes to amend claims 1, 14 and 21. Support for the amendments can be found, for example, on page 12, lines 18-19. No new matter is being introduced.

The Examiner is thanked for the courtesy of a telephone interview on June 19, 2007, initiated by the Applicant to discuss the patentability of claims 1-5, 7-15 and 17-21 in view of the rejections cited herein.

In the Office Action, the Examiner rejected claims 1-5, 7-9 and 14, 15 and 17-21 under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. Also, the Examiner rejected claims 1-5 and 7-9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Silverman [PNAS; April 24, 2001; volume 98, pages 4996-5001] (hereinafter referred to as "Silverman") in view of Clarke et al. [PNAS, 1999, volume 96, pages 7232-7237] (hereinafter referred to as "Clarke") as evidenced by "Glossary of Medical Terms" [Accessed online on 21 March 2007 from www.uwo.ca/pathology/glossary.html; 22 pages] (hereinafter referred to as "Glossary of Medical Terms") as evidenced by the definition of "protein tertiary structure" [Accessed online at www.google.com on 21 March 2007]. In the Office Action, the Examiner also rejected claims 14-15 and 17-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Silverman in view of Clarke as evidenced by "Glossary of Medical Terms" as evidenced by the definition of "protein tertiary structure" as applied to claims 1-5 and 7-9, in further view of Michaud [USPAT 4,017,721].

The comments of the Examiner in forming the rejections are acknowledged and have been carefully considered.

Section 101 Rejection

In the Office Action, the Examiner rejected claims 1-5, 7-9 and 14, 15 and 17-21 under 35 U.S.C. §101 as allegedly being directed to non-statutory subject matter. Specifically, the Examiner stated on page 3 of the Office Action that

> [t]his rejection could be overcome by amendment of the claims to recite that a result of the method is outputted....

Applicant, as proposed herein, has amended independent claims 1, 14 and 21 to include the limitation of outputting the characterization of the amphiphilicity of the tertiary protein structure to a user. As pointed on page 12, lines 18-19, of the specification, "video display 440 is any type of video display suitable for interacting with a human user...."

Applicant respectfully asserts that independent claims 1, 14 and 21, as amended, overcome the §101 rejection. Also, Applicant further submits that by virtue of their dependence on allowable independent claims 1 and 14, claims 2-5, 7-9 and 15, 17-20, respectively, are directed to statutory subject matter in their own right.

Thus, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1-5, 7-9 and 14, 15 and 17-21 under 35 U.S.C. §101

Section 103(a) Rejection # 1

The Examiner rejected claims 1-5 and 7-9 under 35 U.S.C. §103(a) as allegedly being unpatentable over Silverman [PNAS; April 24, 2001; volume 98, pages 4996-5001] (hereinafter referred to as "Silverman") in view of Clarke et al. [PNAS, 1999, volume 96, pages 7232-7237] (hereinafter referred to as "Clarke") as evidenced by "Glossary of Medical Terms" [Accessed online on 21 March 2007 from www.uwo.ca/pathology/glossary.html; 22 pages] (hereinafter referred to as "Glossary of Medical Terms") as evidenced by the definition of "protein tertiary structure" [Accessed online at www.google.com on 21 March 2007].

On page 7 of the outstanding Office Action, the Examiner stated that

> [i]t would have been obvious at the time of the instant invention for someone of ordinary skill in the art to modify the secondary structure element of a protein in Silverman by use of entire protein with a secondary structure that is equivalent to a tertiary structure as shown in Clarke et al... (Emphasis added).

Applicant respectfully disagrees with the Examiner's interpretation of the Clarke reference because, as noted below, Clarke explicitly specifies that the reference does not teach or use a tertiary structure. Consequently, Applicant submits that the combination of the above-noted references is improper. As recently stated by the United States Supreme Court, an obviousness inquiry requires one "to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." KSR Int'l Co. v. Teleflex Inc. 550 U.S. ___ (2007). Applicant, as will be explained further, stresses that there is no apparent reason to combine the known elements of the cited references for at least the reason that the known elements of the references do not even encompass all of the presently claimed limitations.

On page 7 of the Office Action, the Examiner states that "[t]he definition of 'protein tertiary structure' is 'the folding of a protein into a 3-D structure.'" The Examiner, to this point, is correct. Applicant's identical definition search on Google for the phrase "protein tertiary structure" resulted in the same definition. However, the phrase "protein tertiary structure" is not found in the outstanding claims. The correct phrase, as used in the specification and claims, is "tertiary protein structure." (See, e.g., claim 1 and title). An analogous Google search defines the phrase "tertiary protein structure" as "the spatial organization (including conformation) of an entire protein molecule or other macromolecule consisting of a single chain." (Emphasis added). Correspondingly, on page 2 of the instant specification, Applicant notes that the techniques described therein are directed to "measurements pertaining to the entire protein structure." Additionally, as noted throughout the specification and, for example, independent claim 1, the global linear hydrophobic moment is used to characterize the amphiphilicity of a tertiary protein structure, thereby encompassing an entire protein structure as opposed to merely a portion thereof that may be three-dimensional.

By way of example, the use of an entire protein structure is reiterated via examples such as those found beginning at page 15, line 21 of the specification, wherein it states that

> [a]nother protein with enhanced magnitude hydrophobic moment is 2ACT.... The magnitudes of the global linear hydrophobic moments of 2ACT and 1YAL are, however different.... The difference highlights the independence of overall hydrophobic spatial organization with respect to protein structure. (Emphasis added)

In contrast, Clarke does not teach or suggest the use of a tertiary protein structure

Beginning on the bottom of page 6 of the Office Action, the Examiner states that "Clarke et al. explains on page 7232 under 'Materials and Methods' that the compositions of the proteins used to attain the single alpha-helix were polyglutamic acid and polysine." Applicant additionally points to page 7235, right column, of Clarke, wherein it states

> Poly(Glu) and poly(Lys) have no disulfides, aromatics groups, or tertiary structure.... (Emphasis added).

Consequently, Applicant respectfully submits that the above-noted Examiner's statement that "[i]t would have been obvious at the time of the instant invention for someone of ordinary skill in the art to modify the secondary structure element of a protein in Silverman by use of entire protein with a secondary structure that is equivalent to a tertiary structure as shown in Clarke et al." (See page 7 of Office Action) is incorrect because, as shown directly above, Clarke explicitly specifies that the reference does not use or implement a tertiary protein structure.

Additionally, the Examiner also states on page 7 of the Office Action that "Clarke et al. has the advantage of utilizing proteins comprised in their entireties of single structural units." Applicant respectfully asserts that this characterization is incorrect. Applicant points to page 7236, right column, of Clarke, wherein it states that "[a]fter initiation the helix will propagate rapidly, forming a very long helix, including nearly all the residues." (Emphasis added). Consequently, Applicant submits that a helix including "nearly all" of the residues is not consistent or equivalent to "proteins comprised in their entireties of single structural units."

As stated in lines 22-26 of page 12 of the specification,

> [t]he global linear hydrophobic moment is analogous to the dipole moment for the entire tertiary protein structure. Defining a global hydrophobic moment would yield a dual measure comprised of the magnitude and direction of protein amphiphilicity. Thus, the global linear hydrophobic moment characterizes the amphiphilicity of the protein.

Thus, a helix including nearly all of the residues is inconsistent with the limitations of defining a global hydrophobic moment to characterize amphiphilicity of an entire protein.

As a result, Applicant respectfully asserts that even if properly combined, the above-cited references (Silverman in view of Clarke, as evidenced by "Glossary of Medical Terms," as evidenced by the definition of "protein tertiary structure") do not teach or suggest all of the claimed limitations of independent claim 1. The references do not teach or suggest a method for calculating a global hydrophobic moment of a tertiary protein structure, nor do the references specifically teach or suggest the limitation of using a global linear hydrophobic moment to characterize an amphiphilicity of a tertiary protein structure. As detailed above, the Clarke reference explicitly specifies that it does not teach or implement a tertiary protein structure, and as the Examiner noted on page 6 of the Office Action, "Silverman does not show his method for entire proteins." To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). Therefore, Applicant respectfully requests withdrawal of the §103(a) rejection.

Applicant further submits that by virtue of their dependence on allowable independent claim 1, claims 2-5 and 7-9 recite patentable subject matter in their own right. As such, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 1-5 and 7-9 under 35 U.S.C. 103(a).

Section 103(a) Rejection # 2

The Examiner also rejected claims 14-15 and 17-21 under 35 U.S.C. §103(a) as allegedly being unpatentable over Silverman in view of Clarke as evidenced by "Glossary of Medical Terms" as evidenced by the definition of "protein tertiary structure" as applied to claims 1-5 and 7-9, in further view of Michaud [USPAT 4,017,721].

On page 9 of the outstanding Office Action, the Examiner stated that

> [i]t would have been obvious to someone of ordinary skill in the art at the time of the instant invention to modify Silverman in view of Clarke et al. as evidenced by "Glossary of Medical Terms" as evidenced by the definition of "protein tertiary structure" as applied to claims 1-5 and 7-9 above in further view of Michaud because the invention of Michaud has the advantage of using a computerized system to calculate centroids of objects which provide a more efficient means of calculating physical aspects of objects (i.e physical aspects of proteins) than calculation by hand.

Applicant respectfully traverses the Examiner's rejection on the grounds that the proposed combination of Silverman, Clarke as evidenced by "Glossary of Medical Terms" as evidenced by the definition of "protein tertiary structure," and Michaud is improper, and even if the combination were proper, all the limitations of the independent claims are not taught or supported by the combination. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). As detailed above, Silverman in view of Clarke as evidenced by "Glossary of Medical Terms" as evidenced by the definition of "protein tertiary structure" as applied to claims 1-5 and 7-9, does not teach or suggest the claim limitation of using the global linear hydrophobic moment to characterize an amphiphilicity of a tertiary protein structure. Therefore, all of the claimed limitations of claims 14 and 21 are not taught or suggested by the prior art, and as a result, Applicant respectfully asserts that independent claims 14 and 21 overcome the rejection as allegedly unpatentable over the references cited in this rejection.

Also, Applicant further submits that by virtue of their dependence on allowable independent claim 14, claims 15 and 17-20 recite patentable subject matter in their own right. If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, Applicant respectfully requests withdrawal of the §103(a) rejection from claims 14-15 and 17-21.

All of the pending claims, i.e., claims 1-5, 7-15 and 17-21, are in condition for allowance and such favorable action is earnestly solicited.

If any outstanding issues remain, or if the Examiner has any further suggestions for expediting allowance of this application, the Examiner is invited to contact the undersigned at the telephone number indicated below.

The Examiner's attention to this matter is appreciated.

Respectfully submitted,

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